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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Zhang et al.

Serial No. : 10/730,762

Filed: December 8, 2003

For: ENHANCING THERMAL CONDUCTIVITY OF  
FLUIDS WITH GRAPHITE PARTICLES

Atty. Docket No.: AA207/98002

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) Examiner James Goloboy  
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**INFORMATION DISCLOSURE STATEMENT**

Dear Sir:

Enclosed herewith are copies of references which we do not believe are as pertinent as those considered in the parent application; however, we are providing them to be as thorough as possible and to have them considered in the examination of the above-identified application. A check in the amount of \$180.00 is enclosed as payment for submission of an Information Disclosure Statement under 37 CFR §1.97(c)(2).

U.S. Patent No. 6,231,980 B1 by Cohen et al. for "BX CY NZ NANOTUBES AND NANOPARTICLES" which issued May 15, 2001.

U.S. Patent Application Publication No. 2001/0041663 A1 by Moy et al. for "CARBON NANOTUBES IN FUEL AND LUBRICANTS" which was published November 15, 2001.

U.S. Patent Application Publication No. 2002/0042348 A1 by McNeil et al. for "ENGINE, FUEL, GEAR, AND GREASE TREATMENT COMPOSITIONS AND METHODS RELATED THERETO" which was published April 11, 2002.

U.S. Patent Application Publication No. 2002/0076125 A1 by Iso et al. for "ROLLING BEARING" which was published June 20, 2002.

U.S. Patent Application Publication No. 2002/0100578 A1 by Withers et al. for "NANO CARBON MATERIALS FOR ENHANCING THERMAL TRANSFER IN FLUIDS" which was published August 1, 2002.

U.S. Patent No. 6,432,320 B1 by Bonsignore et al. for "REFRIGERANT AND HEAT TRANSFER FLUID ADDITIVE" which issued August 13, 2002.

U.S. Patent No. 6,695,974 B2 by Withers et al. for "NANO CARBON MATERIALS FOR ENHANCING THERMAL TRANSFER IN FLUIDS" which issued February 24, 2004.

U.S. Patent No. 5,652,201 by Papay et al. for "LUBRICATING OIL COMPOSITIONS AND CONCENTRATES AND THE USE THEREOF" which issued July 29, 1997.

U.S. Patent Application Publication No. 2003/0170167 by Nikolaev et al. for "ISOLATION AND PURIFICATION OF SINGLE WALLED CARBON NANOTUBE STRUCTURES" which was published September 11, 2003.

U.S. Patent No. 4,209,408 by Hoke for "LUBRICANTS AND FUNCTIONAL FLUIDS CONTAINING .BETA.-THIOPROPIONITRILES AND SIMILAR POLYFUNCTIONAL NITRILES" which issued June 24, 1980.

U.S. Patent No. 6,419,717 by Moy et al. for "CARBON NANOTUBES IN FUELS" which issued July 16, 2002.

U.S. Patent No. 6,099,965 by Tennent et al. for "RIGID POROUS CARBON STRUCTURES, METHODS OF MAKING, METHODS OF USING AND PRODUCTS CONTAINING SAME" which issued August 8, 2000.

U.S. Patent No. 6,828,282 B2 by Moy et al. for "LUBRICANTS CONTAINING CARBON NANOTUBES" which issued December 7, 2004.

U.S. Patent No. 6,783,746 B1 by Zhang et al. for "PREPARATION OF STABLE NANOTUBE DISPERSIONS IN LIQUIDS" which issued August 31, 2004.

U.S. Patent No. 6,221,275 B1 by Choi et al. for "ENHANCED HEAT TRANSFER USING NANOFUIDS" which issued April 24, 2001.

U.S. Patent No. 5,165,909 by Tennent et al. for "CARBON FIBRILS AND METHOD FOR PRODUCING SAME" which issued November 24, 1992.

U.S. Patent No. 4,372,861 by Chao et al. for "GRAPHITE DISPERSION" which issued February 8, 1983.

U.S. Patent Application Publication No. 2005/0008560 A1 by Kataoka et al. for "ULTRA-DISPERSED NANOCARBON AND METHOD FOR PREPARING THE SAME" which was published January 13, 2005.

U.S. Patent No. 4,434,064 by Chao et al. for "GRAPHITE DISPERSION" which issued February 28, 1984.

U.S. Patent No. 5,292,813 by Patil et al. for "FULLERENE-GRAFTED POLYMERS AND PROCESSES OF MAKING" which issued March 8, 1994.

U.S. Patent No. 5,445,759 by Powell for "PREPARATION OF ELECTORHEOLOGICAL FLUIDS USING FULLERENES AND OTHER CRYSTALS HAVING FULLERENE-LIKE ANISOTROPIC ELECTRICAL PROPERTIES" which issued August 29, 1995.

U.S. Patent No. 5,786,309 by Bradie for "PROCESSES FOR MAKING POLYFLUORFULLERENE AND COMPOSITIONS COMPRISING SAME" which issued July 28, 1998.

U.S. Patent No. 5,372,798 by McConnachie et al. for "FULLERENE COMPOSITIONS AND PREPARATION" which issued December 13, 1994.

U.S. Patent No. 5,454,961 by Schriver et al. for "SUBSTITUTED FULLERENES AS FLOW IMPROVERS" which issued October 3, 1995.

U.S. Patent No. 5,523,006 by Strumban for "ULTRAFINE POWDER LUBRICANT" which issued June 4, 1996.

U.S. Patent No. 5,292,444 by Patil et al. for "LUBE OIL COMPOSITIONS CONTAINING FULLERENE-GRAFTED POLYMERS" which issued March 8, 1994.

U.S. Patent No. 5,958,523 by Bradie for "COATING AND LUBRICANT COMPOSTIIONS CONTAINING POLYFLUORFULLERENES AND METHODS OF USE" which issued September 28, 1999.

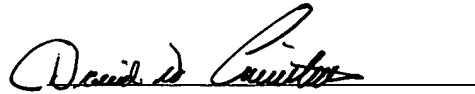
Marquis, F.D.S. and Chibante, L.P.F., "IMPROVING THE HEAT TRANSFER OF NANOFLUIDS AND NANOLUBRICANTS WITH CARBON NANOTUBES," JOM, December 2005, pg. 32, USA.

[http://www.chevron.com/products/prodserv/BaseOils/grp2\\_typical.shtml](http://www.chevron.com/products/prodserv/BaseOils/grp2_typical.shtml)□□[http://www.chevron.com/products/prodserv/BaseOils/grp3\\_typical.shtml](http://www.chevron.com/products/prodserv/BaseOils/grp3_typical.shtml)

Smalheer, C.V. and Smith, R. Kennedy, "LUBRICANT ADDITIVES," 1967, pgs. 1-11, Cleveland, OH, USA.

Gong, Xiaovi et al., "SURFACTANT-ASSISTED PROCESSING OF CARBON NANOTUBE/POLYMER COMPOSITES," Chemistry of Materials, January 2000, pgs. 1047-1052, 12(4), USA.

Respectfully submitted

A handwritten signature in cursive script, reading "David W. Carrithers", is written over a horizontal line.

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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

**Complete if Known**

Application Number	10/730,762
Filing Date	12/8/2003
First Named Inventor	Zhang
Art Unit	1714
Examiner Name	James Goloboy
Attorney Docket Number	AA207/98002/2

Sheet 1 of 3

**U.S. PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
		US- 6,231,980 B1	05-15-2001	Cohen et al.	throughout
		US- 2001/0041663 A1	11-15-2001	Moy et al.	throughout
		US- 2002/0042348 A1	04-11-2002	McNeil et al.	throughout
		US- 2002/0076125 A1	06-20-2002	Iso et al.	throughout
		US- 2002/0100578 A1	08-01-2002	Withers et al.	throughout
		US- 6,432,320 B1	08-13-2002	Bonsignore et al.	throughout
		US- 6,695,974 B2	02-24-2004	Withers et al.	throughout
		US- 5,652,201	07-29-1997	Papay et al.	throughout
		US- 2003/0170167	09-11-2003	Nikolaev et al.	throughout
		US- 4,209,408	06-24-1980	Hoke	throughout
		US- 6,419,717 B2	07-16-2002	Moy et al.	throughout
		US- 6,099,965	08-08-2000	Tennent et al.	throughout
		US- 6,828,282 B2	12-07-2004	Moy et al.	throughout
		US- 6,783,746 B1	08-31-2004	Zhang et al.	throughout
		US- 6,221,275 B1	04-24-2001	Choi et al.	throughout
		US- 5,165,909	11-24-1992	Tennent et al.	throughout
		US- 4,372,961	02-08-1983	Chao et al.	throughout
		US- 2005/0008560 A1	01-13-2005	Kataoka et al.	throughout

**FOREIGN PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
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This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Substitute for form 1449/PTO		<b>Complete if Known</b>			
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(use as many sheets as necessary)</i>		Application Number	10/730,762		
		Filing Date	12/8/2003		
		First Named Inventor	Zhang		
		Art Unit	1714		
		Examiner Name	James Goloboy		
Sheet	2	of	3	Attorney Docket Number	AA207/98002/2

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		Number-Kind Code <sup>2</sup> (if known)			
		US- 4,434,064	02-28-1984	Chao et al.	throughout
		US- 5,292,813	03-08-1994	Patil et al.	throughout
		US- 5,445,759	08-29-1995	Powell	throughout
		US- 5,786,309	07-28-1998	Bradic	throughout
		US- 5,372,798	12-13-1994	McConnachie et al.	throughout
		US- 5,454,961	10-03-1995	Schrivier et al.	throughout
		US- 5,523,006	06-04-1996	Strumban	throughout
		US- 5,292,444	03-08-1994	Patil et al.	throughout
		US- 5,958,523	09-28-1999	Bradic	throughout
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Sheet	3	of	3	Attorney Docket Number	AA207/98002/2

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		MARQUIS, F.D.S. and CHIBANTE, L.P.F., "Improving the Heat Transfer of Nanofluids and Nanolubricants with Carbon Nanotubes," JOM, December 2005, pg.32, USA.	
		SMALHEER, C.V. and SMITH, R. Kennedy, "Lubricant Additives," 1967, pages 1-11, USA.	
		<a href="http://www.chevron.com/products/prodserv/BaseOils/grp2_typical.shtml">http://www.chevron.com/products/prodserv/BaseOils/grp2_typical.shtml</a>	
		<a href="http://www.chevron.com/products/prodserv/BaseOils/grp3_typical.shtml">http://www.chevron.com/products/prodserv/BaseOils/grp3_typical.shtml</a>	
		GONG, Xiaovi et al., "Surfactant-assisted processing of carbon nanoyube/polymer composites," Chemistry of Materials, Jan. 2000, pgs. 1047-1052, 12(4), USA.	

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